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SENATE ARMED SERVICES COMMITTEE
STRATEGIC FORCES SUBCOMMITTEE

STATEMENT OF

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OF THE

SENATE ARMED SERVICES COMMITTEE

ON

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Introduction

Mr. Chairman, distinguished members of the Subcommittee, I am honored to appear before you today to address the Navy's space activities. Space capabilities form the foundation of the Navy's ability to operate forward, especially as the Navy shifts it focus towards the Pacific. As a forward deployed force, the Navy is highly dependent upon space-based systems for over-the-horizon communications and battlespace awareness in support of joint warfighting and global maritime operations. Air-Sea battle, the joint operational concept through which air and naval forces retain freedom of action through tight coordination of operations in and across multiple domains, highlights the particular importance of the space domain. The U.S. has enjoyed uncontested superiority in the space domain for several decades; however, cheaper access to space, proliferation of jamming technology and the emergence of counter-space weapons have begun to level the playing field against peer and near-peer forces.

In an environment of emerging threats in space, the Navy will require continued robust investment and access to space to ensure mission success in a contested environment. Adversaries are becoming more proficient in their use of space capabilities and are developing both offensive and defensive space capabilities in an attempt to remove or reduce the asymmetric advantage the US enjoys in the space domain. It is imperative the Navy continue to leverage space capabilities and work with the other Services to develop and refine the necessary tactics, techniques, procedures, and capabilities to retain Navy fleet information dominance in degraded or denied environments.

The *Navy Strategy for Achieving Information Dominance (2012-2016)* defines Information Dominance as the operational advantage gained from fully integrating the Navy's information functions, capabilities, and resources to optimize decision-making and maximize warfighting effects. Navy leaders increasingly rely on critical satellite communications (SATCOM) paths; positioning, navigation, and timing (PNT) signals; environmental monitoring (EM) data; missile warning (MW); and intelligence, surveillance, and reconnaissance (ISR) reporting for the full range of operations from humanitarian missions to combat operations in one or more theaters. Access to, and mastery in, operations utilizing this combination of space capabilities enables decisiveness, sustainability, responsiveness, and agility – critical requirements for a forward deployed and globally engaged force.

Mobile User Objective System (MUOS)

The increasing reliance on satellite communications and the uncertainty of the antiquated and aging legacy UHF capability are driving the Navy to improve narrowband capacity to support the joint warfighter. The Mobile User Objective System (MUOS) is the communications path that will best allow the Navy and DoD to meet the needs of the future while transitioning the user community from legacy UHF to a much improved wideband code division, multiple access (WCDMA) capability. This technology, which

is similar to third generation (3G) cellular technology, will not only improve bandwidth capacity but will also provide individual users true global access.

The MUOS program continues to make significant strides in achieving its program goals on time and within budget. In February 2012, the first satellite was launched and within eight months was made operational, providing joint access that seamlessly transitioned without any degradation in service. The second MUOS satellite recently completed all pre-launch testing and is now undergoing final preparations for delivery to Cape Canaveral, FL in preparation for launch on July 19, 2013. The remaining three satellites are all on budget and on schedule.

In addition to the spacecraft, the MUOS program continues to meet objectives for the ground sites in Geraldton, Australia, Wahiawa, HI and Northwest, VA. These sites have recently completed final hardware installation and will complete final acceptance testing by the end of this summer. The last remaining site Niscemi, Sicily, in Italy, has had some setbacks in recent months as Italian protesters have delayed progress. The U.S. and the central Italian governments are working together closely to maintain unfettered access to the site. Recently, the Italian government commissioned a radio frequency study to reassure the local population that all RF levels at the site are within normal operating levels. Two previous studies have been conducted by the US Navy with acceptable results for both U.S. and Italian standards. The Navy's goal is to resume work at Niscemi by this summer to complete the site by the end of 2014 in preparation for the launch of MUOS 3.

The final segment needed to achieve full MUOS capability is the fielding of the MUOS-capable terminals. The MUOS waveform software was completed in November 2012 and placed in the Joint Tactical Network Center (JTNC) Information Repository and made available to industry in December 2012. The first terminal that will be fielded and used to complete MUOS End-to-End (E2E) testing will be the AN/PRC-155 Manpack Radio, previously known as Joint Tactical Radio System Manpack terminal. The U.S. Army PEO C3T Tactical Radio Program is developing this terminal by adding the MUOS capability to this new radio. Additionally, the Navy is currently providing RDT&E funds to develop a MUOS-capable Digital Modular Radio (DMR) to support shipboard operations. Other manufacturers are developing radios for use with MUOS in the near future.

Since the beginning of the MUOS program, development of the full MUOS capability has been managed through multiple program offices, including PMW-146 (Navy), Tactical Radio Program Office (Army), JTNC (Army) and the Defense Information Systems Agency. In May 2012, OSD (AT&L) assigned the Navy overall responsibility to deliver the MUOS E2E capability. In order to reduce risk associated with seams between each of the program offices, risk reduction testing has been added to the overall schedule. This testing will evaluate the interfaces between the space, ground, and terminal portions of the system. Testing began in March 2013 and will continue in phases through 2013 and 2014 as additional system components become available.

Positioning, Navigation, and Timing

The Navy continues to use the Air Force's NAVSTAR Global Positioning System (GPS) as its primary source of space-based, precise PNT data for all platforms, munitions, combat systems, and command, control, communications, computer, and intelligence (C4I) systems. GPS provides a common PNT reference for all U.S. military users as well as select coalition partners. GPS delivers the necessary underpinning for enabling Information Dominance across the Fleet. In order to maintain access to the data provided by GPS, especially in contested and denied environments, the Navy is taking proactive measures to ensure its continued reception and use.

Development of the Navy's recently awarded multi-year contract to Raytheon Integrated Defense Systems for a follow-on shipboard PNT fusion and distribution system, GPS-based PNT Service (GPNTS), continues to progress as scheduled. The GPNTS program is replacing legacy GPS shipboard user systems dating from the 1980s and 1990s and recently completed a successful Critical Design Review ahead of schedule. GPNTS incorporates the latest GPS security architecture and features redundant clocks as well as anti-jam antennas. It is being designed to incorporate the next generation of military GPS receivers capable of utilizing the new GPS M-code signal once it becomes available from the Air Force. GPNTS will also distribute common positioning data and synchronized precise time and frequency to all systems on a ship that require this information.

Additionally, the Navy continues to procure and install anti-jam GPS antennas on its manned aircraft and has initiated the development of GPS anti-jam antennas for both the submarine force and its fleet of unmanned aircraft systems.

Precise time and time interval is absolutely critical to the effective employment of a myriad of Department of Defense (DoD) systems, including weapons systems, command and control systems, communications systems, and information technology networks. The U.S. Naval Observatory (USNO) is responsible for maintaining precise time and time interval for all Department of Defense (DoD) users. Coordinated Universal Time (UTC) is the DoD standard and is the primary precise time reference for GPS and numerous other military applications. The Navy remains at the forefront of timekeeping technology. In Fiscal Year 2012, the USNO built and incorporated four new rubidium fountain atomic clocks to the Master Clock (MC) with full operating capability (FOC) scheduled for the end of Fiscal Year 2013. The installation of two rubidium fountain atomic clocks at the DoD Alternate Master Clock (AMC) facility is in progress with FOC scheduled for FY15. These additions to USNO's time keeping suite will improve the precision and accuracy of USNO UTC, which is required to support future Joint systems and operations. The Navy continues to closely coordinate with the Air Force to ensure the USNO Master Clock is fully supportive of the new GPS III architecture.

Additionally, the Navy has other ongoing initiatives to ensure precise time and time interval is readily available to all DoD users. These initiatives primarily include

improving the current infrastructure for distributing precise time to DoD users and the development of alternate methods for distribution. These efforts are being resourced and executed in concert with DoD Chief Information Officer (CIO) priorities and long term strategy for Assured PNT.

Environmental Monitoring

Navy provides the DoD with global atmospheric modeling and global and regional ocean modeling. In October 2012, the Navy Operational Global Atmospheric Prediction System model was upgraded to the Navy Global Environmental Model, which immediately improved forecast accuracy. In order to produce these accurate forecasts, the Navy also relies on partnerships with the Air Force, civil, and international agencies to meet our space-based environmental sensing requirements. Meeting these requirements is critical to the planning for, and execution of, safe, effective military operations. To this end, the Navy is fully engaged supporting the Space-Based Environmental Monitoring AoA that is being conducted by the Air Force to define requirements for the follow-on to the Defense Meteorological Satellite Program in order to mitigate potential national and international data collection gaps.

Missile Warning and Intelligence, Surveillance, and Reconnaissance (ISR)

Space-based assets provide unique access to information critical to decision making, whether it is knowledge of an immediate military threat or insight into a hazard resulting from a natural disaster. The global maritime picture built by quilting together a variety of sources, including those that allow mapping ice boundaries in the polar regions and other oceanographic efforts, can result in greater maritime domain awareness and lead to more effective defenses from seaborne threats, as well as safer navigation for the world's merchant fleets.

The Navy continues to engage the Intelligence Community (IC) as it plans future acquisitions and considers commercial capabilities to help meet our nation's ISR needs. The Navy is striving to foster a better understanding across the IC of the unique ISR requirements in the maritime domain, improving the ease with which Navy requirements can be factored into acquisition decisions and the probability they can be met, or partially met, in a highly competitive, cost-constrained environment. The Navy requirements are very different from land targets; in the open ocean, and especially in littoral areas, ships are constantly moving, requiring larger area coverage and more frequent revisits to maintain reliable tracks. The Navy continues to work toward greater U.S. and international collaboration using civil and commercial, as well as national security space systems, to gain increased persistence and area coverage, reduce cost, and improve global maritime domain awareness.

Navy continues to leverage its Tactical Exploitation of National Capabilities (TENCAP) effort as well as research labs to explore new methods for adapting existing systems to meet Navy requirements. Through TENCAP initiatives Navy has developed and fielded maritime- specific ISR capabilities at low cost, leveraging global Geospatial

Intelligence (GEOINT) and Signal Intelligence (SIGINT) systems to enable a fused common operational picture (COP). Efforts have resulted in improved onboard spacecraft sensor and ground processing, greater downlink bandwidth through advanced data compression, and enhanced geo-location techniques. Additionally, Navy, broader interagency and department collaboration, has fielded and transitioned capability that significantly enhances the indications and warning of adversary Unmanned Aircraft System (UAS) activity, establishing a system baseline that can be adapted to meet evolving foreign unmanned system threats. Navy TENCAP, in partnership with the IC, DoD, and Services, is developing an integrated ISR and Cyber multi-source capability to fuse national intelligence system data with tactical unit collection within a single classified security domain. This initiative has the potential to unlock vast stores of operationally relevant data currently inaccessible to tactical users because of multiple security enclaves and related policies, proprietary industry designs, and organizational controls.

Commercial systems have collection capabilities well suited to support maritime surveillance that can also be used to fill collection gaps. These efforts are paying dividends, but more investment in research and development is needed. As budgets decline, it will be new collection modes, processing technologies, and exploitation strategies, combined with ensuring that future systems accommodate unique Navy maritime requirements, which will produce the timely, precise, and relevant information so vital to 21st century naval warfare.

Conclusion

The Navy continues to be heavily reliant upon space for SATCOM, PNT, MW, EM, and ISR information in order to enable swift and decisive decision making in increasingly contested and denied environments. Growing global uncertainty, as well as the current fiscal environment, will continue to require the Navy to become more efficient in the use of available assets in order to maintain the level of effectiveness that the nation expects. This will require continued vigilance to ensure that threats to the space constellations are continuously evaluated and that mitigations are in place to ensure forward-deployed commanders have the tools necessary to ensure mission success.

Mr. Chairman - thank you for the opportunity to share our efforts with you today. We look forward to answering any questions you and the Subcommittee may have.